Technical Disclosure Commons

Defensive Publications Series

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DOOR LOCKER DESIGN TO DETECT TWO DOORS OPEN/CLOSE STATES WITH ONLY ONE SENSOR

HP INC

Door locker design to detect two doors open/close states with only one sensor

In design jet printers, there are different types of door accesses: some of them are used for daily interactions but some others are for specific consumable parts replacement. Depending on the usage, the request for the best customer experience is to **avoid screws when opening a door is a frequent operation.**

From the other hand, if the mentioned door (without screws) allows access to internal areas of the printer, there's a need of adding a sensor to detect if it's properly closed before launching any movement. And those sensors increase cost, they need detailed design margin studies and FW routines.

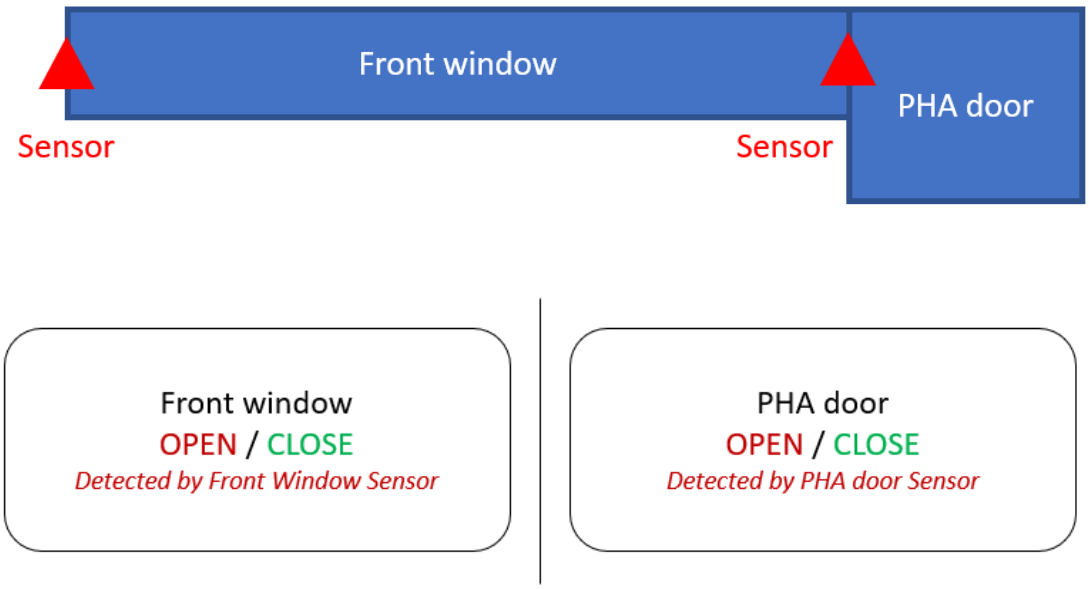
This is the case of the Front window and Print Head assembly (PHA) replacement doors in design jet printers.

The Front window allows direct access into the print zone area, where user can remove jams or do simple maintenance operations.

The PHA door is used for a less frequent Print head replacement operations, but customer experience team requested to avoid screws and facilitate operation.

Current configuration works as follows: - *see **Fig# 1*** -

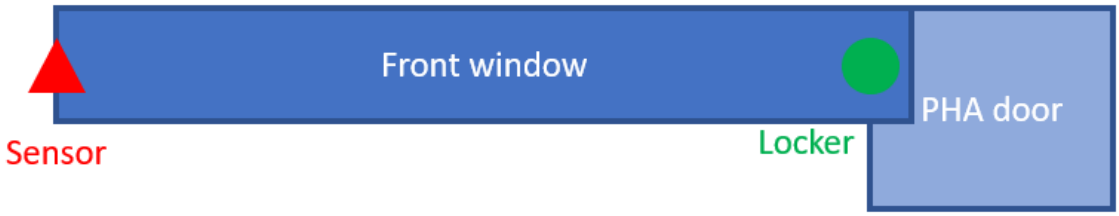
- Front window
    - Open – detected by front window sensor – no movement allowed while window open
    - Close – detected by front window sensor – start printing
- PHA door
    - Open – detected by PHA door sensor – no movement allowed while door open
    - Close – detected by PHA door sensor – start printing

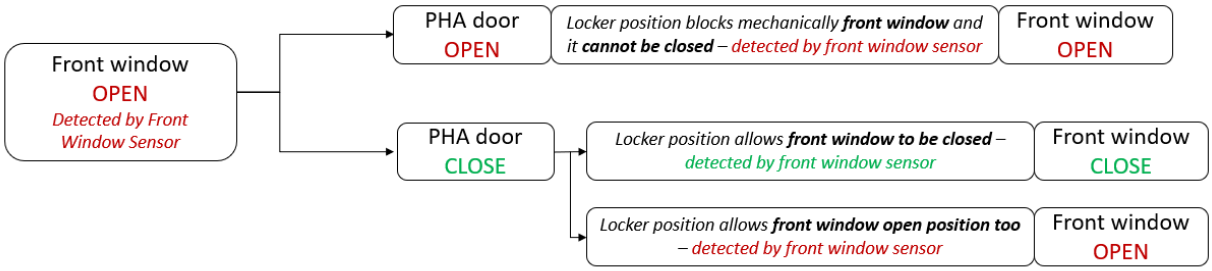


- ***Fig# 1:*** *New configuration of Front window and PHA door Open or Close states detection using sensors* -

New configuration works as follows: - *see* ***Fig# 2*** -

- Front window (same as current configuration)
  - Open – detected by front window sensor – no movement allowed while window open
  - Close – detected by front window sensor – start printing
- PHA door
  - Open – Locker position blocks mechanically front window and it cannot be closed – detected by *front window* sensor – no movement allowed while door and window are open
  - Close – Locker comes back to its original position and it allows front window to close – detected by *front window* sensor – if front window is still open, no movement allowed and once front window close, user can print again**.**





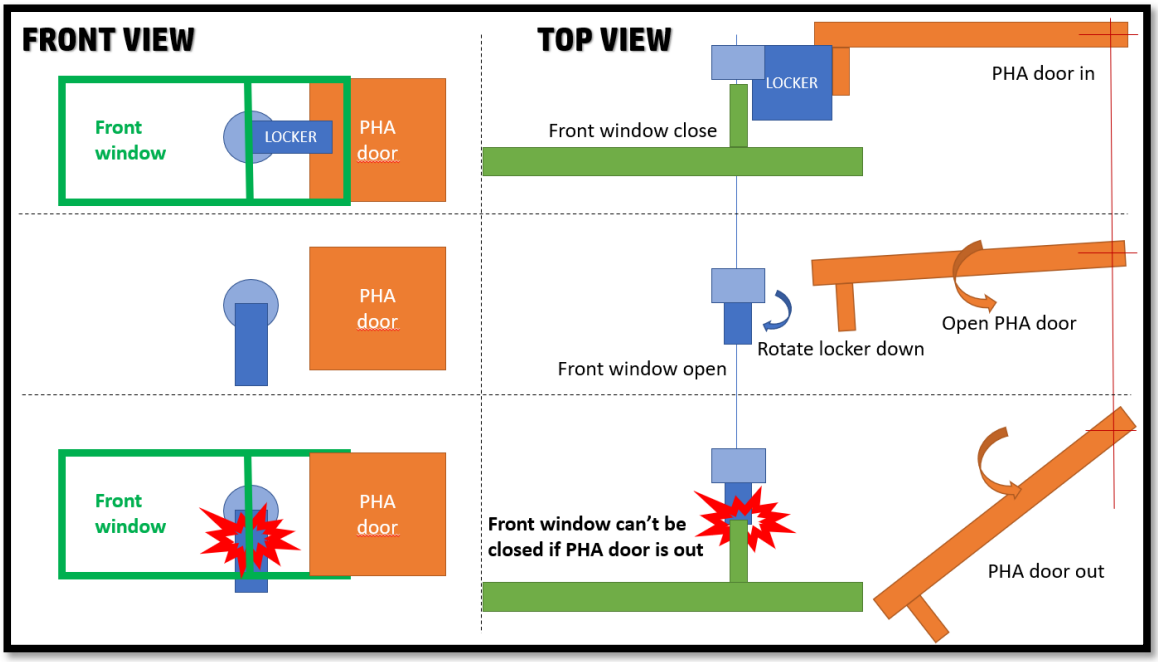
- ***Fig# 2:*** *New configuration of Front window and PHA door Open or Close states detection using locker design* -

The design of this mechanical locker must ensure by its geometry that:

- When PHA door is open, the locker geometry crashes against the front window matching geometry. This interference avoids window to be close.
- When PHA door is close, the locker geometry is in a new position where window has no interference with it.

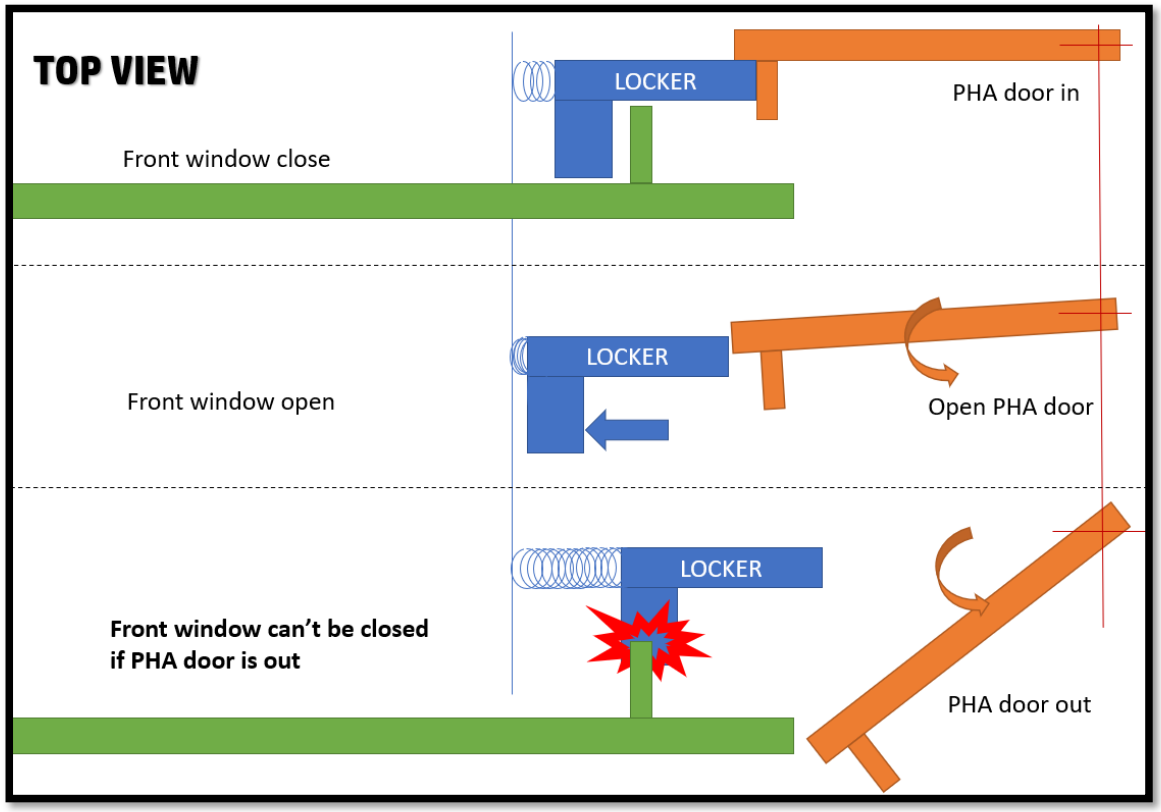
Let's give some examples of those mechanical lockers.

Rotational key - see ***Fig# 3*** -



- ***Fig# 3:*** *Rotational key example of locker design* -

*Spring loaded locker- see **Fig# 4** -*



*- **Fig# 4:** Spring loaded example of locker design -*

Using this locker design will mean many advantages on:

- Mechanical design, firm ware and electronics simplicity as no sensor is required.
- User experience request to avoid screws, while keeping safety requirements to limit the access to internal areas.
- Cost efficiency.

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